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Friday, September 08, 2017

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Hurricane coverage:

1 — Residents cough, rub eyes in Harvey pollution spike, ABC News, 9/8/2017
http://abcnews.go.com/US/wireStory/residents-cough-rub-eyes-harvey-pollution-spike-49698580
Petrochemical corridor residents say air that is bad enough on normal days got worse as Harvey crashed into the nation's fourth-largest city and then yielded the highest ozone pollution so far this year anywhere in Texas.

2 — EPA Chief Pledges to Secure Toxic Sites in Irma's Storm Path, Bloomberg, 9/7/2017
https://www.bloomberg.com/news/articles/2017-09-07/epa-chief-pledges-to-secure-toxic-sites-in-irma-s-storm-path
The Trump administration is applying lessons from Hurricane Harvey's drenching of southeast Texas as it secures toxic waste sites in the path of Hurricane Irma, U.S. environmental chief Scott Pruitt said.

3 — EPA chief says ready to further relax fuel standards due to hurricanes, Reuters, 9/7/2017
https://www.reuters.com/article/us-storm-irma-epa/epa-chief-says-ready-to-further-relax-fuel-standards-due-to-hurricanes-idUSKCN1BJ01S
The U.S. Environmental Protection Agency is preparing for Hurricane Irma's landfall on the U.S. East Coast by securing vulnerable toxic waste sites and easing gasoline standards to ensure steady fuel supplies, its chief told Reuters on Thursday.

4 — Chemical risk database targeted by Congress, Houston Chronicle, 9/7/2017
http://www.houstonchronicle.com/business/article/Chemical-risk-database-targeted-by-Congress-12181809.php
When floodwaters come up, seeping into industrial areas that turn out fuel or chemicals, public health officials look to a federal database known simply as IRIS.

5 — EDITORIAL: They warned us, but few listened, Houston Chronicle, 9/7/2017
http://www.houstonchronicle.com/opinion/editorials/article/They-warned-us-but-few-listened-12181607.php
Who could have predicted the disaster wrought by Hurricane Harvey? The answer, of course, is that plenty of people saw this coming.

6 — What lessons will Houston-area officials learn from Harvey? History gives us a clue, Texas Tribune, 9/8/2017
https://www.texastribune.org/2017/09/08/what-lessons-will-houston-area-officials-learn-harvey-history-gives-us/
As Houston begins to recover from Harvey, a growing chorus of voices is calling for big policy changes to reduce flood damage from future disasters. Local officials haven't said much about what they might pursue, but history offers some clues.

7 — Hurricane Irma downgraded to Category 4 storm, still 'extremely dangerous', New Orleans Times-Picayune, 9/7/17
http://www.nola.com/hurricane/index.ssf/2017/09/hurricane_irma_category_4.html#incart_2box

Hurricane Irma was downgraded to a Category 4 storm early Friday morning (Sept. 8), according to the National Hurricane Center. However, forecasters said the storm remains "dangerous" and "extremely powerful."

8 — Hurricanes Are Sweeping The Atlantic. What's The Role Of Climate Change?, NPR, 9/8/17
http://www.npr.org/sections/thetwo-way/2017/09/08/549280066/hurricanes-are-sweeping-the-atlantic-whats-the-role-of-climate-change
Hurricane Irma is hovering somewhere between being the most- and second-most powerful hurricane recorded in the Atlantic. It follows Harvey, which dumped trillions of gallons of water on South Texas. And now, Hurricane Jose is falling into step behind Irma, and gathering strength. Is this what climate change scientists predicted? In a word, yes.

9 — Researchers warn of high bacteria levels in Clear Lake floodwaters, Houston Chronicle, 9/7/17
http://www.chron.com/news/houston-texas/houston/article/Researchers-warn-of-high-bacteria-levels-in-Clear-12181528.php
University of Houston-Clear Lake researchers have found staggering levels of dangerous E. coli and other fecal bacteria in Hurricane Harvey floodwaters in the Clear Lake watershed.

Residents cough, rub eyes in Harvey pollution spike

By FRANK BAJAK AND MICHELLE MINKOFF, ASSOCIATED PRESS
GALENA PARK, Texas — Sep 8, 2017, 9:05 AM ET

The Associated Press

COMING UP | Meet the Good Samaritans helping their neighbors in the aftermath of Harvey

Cindy Sanchez began to feel ill while barbecuing just before Harvey's torrents started pelting this city just east of Houston, along a corridor with the nation's highest concentration of petrochemical plants.

"I started getting really, really bad headaches," said Sanchez, a 32-year-old housewife. "I never get headaches."

"My husband's eyes were burning," she said. "He actually had a napkin that was wet over his eyes." The sewage-like stench chased the couple indoors and Sanchez, sick to her stomach, lay down.

People complained of headaches, nausea, itchy skin and throats — classic symptoms of industrial chemical exposure — as plants and refineries raced to burn off compounds that could combust in extreme weather or power loss.

Petrochemical corridor residents say air that is bad enough on normal days got worse as Harvey crashed into the nation's fourth-largest city and then yielded the highest ozone pollution so far this year anywhere in Texas. The Houston metro area was ranked 12th in the nation for worst ozone pollution by The American Lung Association this year, although its air was better than the Los Angeles and New York regions.

Plants owned by Shell, Chevron, Exxon-Mobil and other industry giants reported more than 1.5 million pounds (680 metric tons) of extraordinary emissions over eight days beginning Aug. 23 to the Texas Commission of Environmental Quality in Harris County, which encompasses Houston. That amounted to 61 percent of this year's largely unpermitted emissions for the county and five times the amount released in the same period in 2016. Of the known carcinogens released during Harvey, more than 13 tons were benzene. Inhaling it can cause dizziness and even unconsciousness and long-term exposure can trigger leukemia.

Asked about the health effects of the dramatic emissions spike, state environmental commission spokeswoman Andrea Morrow said "all measured concentrations were well below levels of health concern" and "local residents should not be concerned about air quality issues related to the effects of the storm." The federal Environmental Protection Agencyissued a similar statement.

Yet most air monitors were knocked out or offline during Harvey's wrath, making measurement difficult.

Texas sets fines low for industrial polluters— at $25,000 per day for federal clean air violations. Big plants tend to delay shutdowns for as long as possible when a hurricane is coming — then restart quickly afterward — triggering another spike in unhealthy emissions, said Daniel Cohan, a Rice University environmental scientist.

"These (plants) are three and four decades old, beasts that are meant to operate all the time."

Asked if emissions could have been reduced by winding down plant operations sooner, American Petroleum Institute spokesman Reid Porter said: "We are still gathering information and making assessments."

Some emissions were triggered by the sheer volume of Harvey's deluge.

At an Arkema Inc. plant about 25 miles (40 kilometers) northeast of downtown Houston, organic peroxides rendered unstable by lost refrigeration exploded in flames and cast an acrid plume. At least 18 tons burned after people within a 1.5-mile (2.4-kilometer) radius were evacuated. On Thursday, seven sheriff's deputies and emergency medical responders sued Arkema in state court for gross negligence, claiming fumes from the incident made them vomit and gasp for air.

Benzene and other toxins spilled into the air outside the Valero Partners refinery on Houston's east side, as heavy rains damaged a tank's floating roof and invaded a dike.

A city health department air monitor downwind of the refinery on Friday registered an alarming level of up to 14,000 parts per billion of volatile organic compounds, some carcinogenic, said department chief scientist Loren Raun, and aerial monitoring continued to detect benzene on Monday.

On Sept. 1, Houston registered Texas' worst ozone pollution this year — an average of 95 parts per billion (ppb) over eight hours. It was Harris County's first of four straight days of unhealthy ozone levels, exceeding the EPA standard of 70 ppb.

By volume, most of Harris County's emissions were sulfur dioxide, nitrogen oxides and volatile organic compounds, which break down to fine particles and ozone that all can cause respiratory problems, especially for people with asthma and emphysema, said Miriam Rotkin-Ellman, a health scientist for environmental group Natural Resources Defense Council.

Of the dozen plants in Harris County reporting storm-related emissions, Exxon Mobil, Chevron Phillips and Shell Oil have been fined or ordered to pay settlements totaling $27.8 million since 2010 for violating federal environmental laws after suits by The Sierra Club and Environment Texas. A federal judge ordered Exxon Mobil in May to pay most of it — $19.9 million — for illegal emissions from its Baytown refinery.

Exxon Mobil is appealing. The other two companies paid, said Philip Hilder, attorney for the environmental groups.

In heavily Latino lower middle-income communities like Pasadena and Galena Park, which sit along the plant and refinery corridor near Houston's seaport, some residents complained of feeling sick during Harvey.

Ruben Basurto, who lives two blocks from a petrochemical shipping terminal and refinery, described major flaring as Harvey hit — the burning off of volatile byproducts of petrochemical manufacture that sends flames soaring from plant stacks. The air reeked of natural gas, he said, driving him and his friends inside.

"It still smelled at midweek, more during the night," said the 33-year-old construction worker.

As the storm closed in, Gov. Greg Abbott decreed the temporary suspension of emissions regulations. The state environmental agency's director said Texas law could exempt refineries and chemical plants from state fines and liability for extraordinary releases resulting from "an act of God, war, strike, riot, or other catastrophe. "

In Galena Park, mothers in a private Facebook group described sickening odors like "sweet gasoline," raw sewage and thick air.

Some in the city of 11,000 with a median household income of $43,000 called 911 but police were too busy to respond, said local environmental activist Juan Flores.

"A lot of people are afraid to talk because their husbands work in the plants," said Flores.

People in the petrochemical corridor should be provided health screening as a next step in Harvey recovery, said Rotkin-Ellman of the environmental group NRDC.

A Harris County pollution control services toxicologist, Latrice Babin, said she was not aware of any special screening.

Sanchez's headaches still hadn't gone away on Wednesday. Nor had the sickening smell, she said.

She wants to see a doctor, but like many in her neighborhood, she said, Sanchez currently has no health insurance.

"I don't even know where I would start."

EPA Chief Pledges to Secure Toxic Sites in Irma's Storm Path

By Jennifer A Dlouhy
September 7, 2017, 6:12 PM CDT
September 7, 2017, 7:54 PM CDT

- Pruitt says staff already securing 80 Superfund sites
- Harvey, Katrina offer lessons on real-time hurricane response

Hurricane Irma on a Collision Course With Florida

The Trump administration is applying lessons from Hurricane Harvey's drenching of southeast Texas as it secures toxic waste sites in the path of Hurricane Irma, U.S. environmental chief Scott Pruitt said.

The Environmental Protection Agency's main goal is to make sure there are "enough people on the ground" to quickly assess the integrity of at-risk chemical sites and respond to needs as the monster storm moves through, Pruitt said. Technical staff are already working to secure about 80 Superfund sites in Irma's path from Miami to North Carolina, including a former pesticide plant, military base and machine shop.

"Operationally, we've tried to make sure we apply the same type of approach we used in Texas," Pruitt, EPA's administrator, said in an interview Thursday. "Because of the area and the amount of population that's affected in Florida, we're trying to be even more aggressive."

The EPA faced some criticism for its response to Hurricane Harvey in Texas, as it was not able to immediately inspect some toxic Superfund sites that were flooded or inaccessible. After chemicals at one plant exploded, spewing fumes into the air, EPA said an initial analysis showed "no high levels of toxic chemicals." Earlier Thursday, local police officers filed a lawsuit against the plant owners, Arkema SA, saying they were sickened by the fumes from the plant.

Nearly 200 EPA personnel were deployed in Texas. The agency already has about 77 people working on Irma related efforts and another seven are on the way.

Back-to-back hurricanes hitting the U.S. threaten to strain the federal government's resources, prompting the Senate to pass a $15.25 billion relief bill Thursday, and renewing a debate about the size and scope of federal agencies. The Trump administration has proposed cutting nearly a third of the EPA's budget for the fiscal year that begins Oct. 1 and culling roughly 3,200 employees from the agency's 15,000-member workforce, a process that has already begun as hundreds of workers accept buyouts.

Earlier Story: Vacant U.S. Posts Hamper Hurricane Aid as Irma Set to Strike

Pruitt stressed the EPA has not been hit by budget reductions yet, as Congress weighs how much to spend on the agency. Both Republican and Democratic lawmakers have signaled they will refuse to make the steep budget cuts President Donald Trump is seeking for EPA.

"Congress is working through the budget as we speak, so there's been no impact in that regard," Pruitt said. "It's more of just simply allocating personnel and prioritizing personnel -- making sure that at the end of the day it's the local officials and the state officials in partnership with the EPA."

EPA chief says ready to further relax fuel standards due to hurricanes

Valerie Volcovici

File Photo: Environmental Protection Agency Administrator Scott Pruitt speaks during an interview for Reuters at his office in Washington, U.S., July 10, 2017. REUTERS/Yuri Gripas

WASHINGTON (Reuters) - The U.S. Environmental Protection Agency is preparing for Hurricane Irma's landfall on the U.S. East Coast by securing vulnerable toxic waste sites and easing gasoline standards to ensure steady fuel supplies, its chief told Reuters on Thursday.

EPA Administrator Scott Pruitt declined to say whether he believed claims by scientists that the second powerful storm to affect the United States in two weeks may have a link to warmer air and water temperatures resulting from climate change.

"The most we can do is help people in these areas by monitoring drinking water and respond to real and tangible issues," he said in a brief telephone interview.

Hurricane Irma is expected to make landfall in Florida as early as Friday after slamming Caribbean islands with 185 mph winds, only days after Hurricane Harvey triggered record flooding in Texas that killed scores of people.

The EPA said has issued waivers on certain federal requirements for the sale, production and blending of gasoline to avoid supply shortfalls in the aftermath of Harvey and as Hurricane Irma approaches Florida.

Pruitt said he spoke with Florida Governor Rick Scott about potentially issuing more waivers on gasoline requirements if the need arises after Irma.

"EPA will grant additional waivers if requested," he said.

He said the agency is also evaluating 80 Superfund toxic waste sites from Florida to North Carolina to identify those at risk of flooding.

The EPA has yet to finish assessing the impact of Harvey on Texas Superfund sites - heavily contaminated former industrial zones - amid widespread flooding. On Saturday, the agency said 13 sites were flooded or damaged, but the full impact on surrounding areas was not immediately clear.

Pruitt said the agency is also continuing to seek additional information about explosions last week at

French chemical company Arkema's flooded plant in Crosby, Texas, which sickened more than a dozen law enforcement personnel and prompted an evacuation of the surrounding area.

BUSINESS

Chemical risk database targeted by Congress

CHEMICALS: A federal database on risk is in danger of having its funding cut by Congress

By James Osborne | September 7, 2017

1

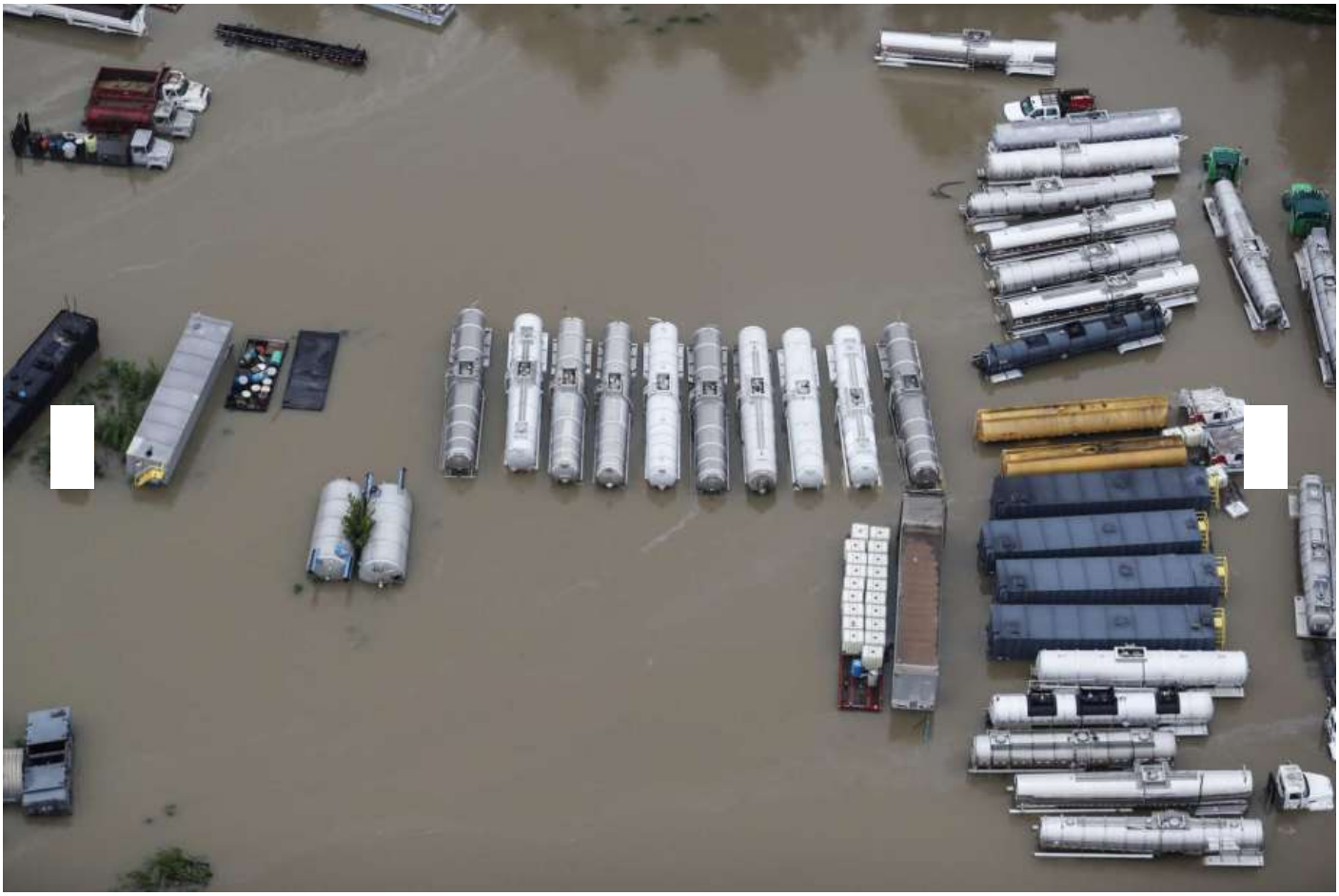


Photo: Brett Coomer, Staff

IMAGE 1 OF 3

These industrial vehicles in Houston were in floodwaters last month from Harvey. The EPA maintains a program called IRIS to assess the health risks of various chemical compounds.

WASHINGTON - When floodwaters come up, seeping into industrial areas that turn out fuel or chemicals, public health officials look to a federal database known simply as IRIS.

Short for Integrated Risk Information System, the Environmental Protection Agency maintains the program to assess the health risks of various chemical compounds and as a go-to encyclopedia for state agencies on their impacts on human populations.

"These are the folks that are there when Corpus Christi, Texas, has a question about an inadvertent contamination of their water supply," Thomas Burke, a public health professor at Johns Hopkins University, testified Wednesday to Congress. "IRIS is an importation database that doesn't just look at cancer and rats."

Now in the aftermath of Hurricane Harvey's flooding of the Texas Gulf Coast, the future of that program is falling into question as Congress looks to cut the EPA's budget.

Under President Donald Trump's original budget released earlier this year, the agency would have seen its budget slashed more than 30 percent and IRIS eliminated altogether. But under a House appropriations bill released this summer, the EPA's budget saw a far smaller cut of $528 million - about 6 percent of its 2017 budget - leaving IRIS intact but financially weakened.

The program has long been controversial within the chemical industry, which has criticized the EPA's scientific methods and questioned IRIS's priorities.

"Everybody has a difference of opinion of what degree it needs to change," said Ed Krenik, a lobbyist for the chemical industry.

At a hearing before the House Science, Space and Technology Committee, Republicans echoed those concerns, calling for an

BUSINESS

Harvey could add to oil glut, depress prices

FEMA considers faster way to buy out Houston homes swamped by

Chemical risk database targeted by Congress

overhaul in how IRIS goes about assessing the risk of chemicals that support an industry worth hundreds of billions of dollars a year.

Harvey roundup: Ranchers tally impact on soggy herds

Eli Lilly will slash 3,500 jobs

FEMA looks to buy out homes flooded by Hurricane Harvey

"IRIS assessments are not based on sound science," said Rep. Darin LaHood, R-Ill. "There are multiple instances of the IRIS program relying on outdated or flawed studies."

Republicans pointed to a series of reports by both the Government Accountability Office and the National Academy of Sciences that recommended changes in IRIS's scientific method, following a controversial 2010 assessment that the chemical formaldehyde caused cancer when inhaled.

Advocates for the program, like Burke, maintain that IRIS is addressing those areas of concern and improving its methods.

But James Bus, a toxicologist with the consulting firm Exponent, whose work is supported by the American Chemistry Council, a trade group representing the industry, testified the EPA had a history of reliance on health findings that could not be reproduced and rushing peer reviews of its scientific work.

"IRIS might be going down the right road, but they still have a lot of work ahead of them," Bus said.

James Osborne

Washington Energy Correspondent

EDITORIALS

They warned us, but few listened

Houston must listen to the advocates and experts who predicted the unpredictable.

 | September 7, 2017

1

Photo: Brett Coomer, Staff

A neighborhood is inundated by floodwaters from Harvey near east Interstate 10 on Aug. 29 in Houston. (Brett Coomer / Houston Chronicle)

Who could have predicted the disaster wrought by Hurricane Harvey?

Who could have foreseen that the Addicks Dam would overflow its spillway? Or that dangerous materials from EPA Superfund sites could be washed into floodwaters? Or that chemical companies could keep the public in the dark about toxic risks while their plants burned?

The answer, of course, is that plenty of people saw this coming.

Hydrologists and activists had long warned about how unplanned development would risk routine flooding.

Environmentalists and investigative reporters warned about the toxic threats that loomed in the east end of our city.

Climate scientists warned that a warming planet could bring stronger storms and monsoon-like rains that we experienced less than two weeks back.

How many more floods will it take, how many homes destroyed and lives lost, until Houston stops clinging to a status quo that treats these disasters as an inexorable part of life and starts listening to the people who saw it coming?

Jim Blackburn warned us. As an environmental attorney, he represented the Sierra Club in a 2011 lawsuit against the construction of the Grand Parkway that alleged continued paving of the Katy Prairie would exacerbate runoff into the Addicks and Barker reservoirs and put the dams at risk. He lost that lawsuit.

The 2016 Tax Day floods set a new record at both reservoirs. Harvey forced Addicks to overtop its spillway, a dangerous first-time event. Nearby homes might remain

EDITORIALS

They warned us, but few listened

The right pick for a challenging time

Seeking a new vision after Harvey

Friday letters: Character of Houston, downtown courtrooms,

underwater for weeks.

Parker: The worst is yet to come

David Conrad and Larry Larson warned us. They collaborated on a 1998 "Higher Ground" study that offered recommendations for flood prevention back when we still had the opportunity to implement land use regulations in undeveloped flood zones.

Did our political leaders heed that foreboding message? "They didn't," the duo wrote this week in the Washington Post. "Houston did some buyouts, but repetitive losses continued to mount as development pushed along mostly unfettered."

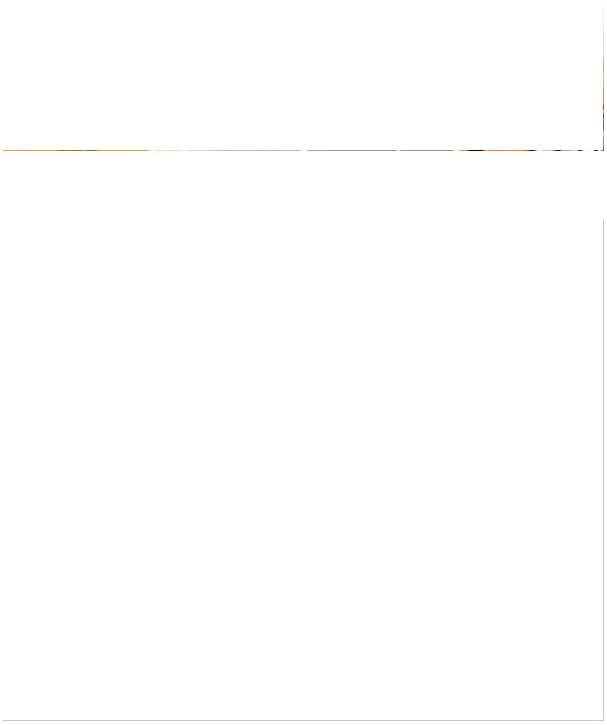
Jackie Young warned us. The executive director of the Texas Health and Environment Alliance was an advocate for a full cleanup of the San Jacinto waste pits long before a storm struck the precariously positioned storage tanks of carcinogenic dioxins. Now it may be too late.

The Houston Air Alliance warned us. The local nonprofit has tried to force transparency on a notoriously opaque chemicals industry. When an Arkema facility caught fire during Harvey, the company refused to reveal the full truth about what dangerous materials might exist at the site. Seven first responders who became ill after the emergency are now suing the company in civil court, and we hope that a criminal investigation will follow.

Harvey was a catastrophe. The Tax Day flood in 2016 was a catastrophe. The Memorial Day flood in 2015 was a catastrophe, and so were the litany of other major flooding events that have struck our city. One-hundred-year floods have become one-year floods. Yet far too many developers, lobbyists and politicians want to turn their backs to the potential death and

destruction. Think of it as a man who survived a series of heart attacks but argues that, since it didn't kill him, there's no reason to stop eating cheeseburgers and fries twice a day.

We need to stop yielding political power to those who insist there's little we can or should do to keep us safe. Because nothing can be further from the truth. Plenty of Houstonians warned us. They've spent years futilely trying to turn their ideas into action, only to see their efforts quashed by a political structure that insists there's no improving upon unregulated concrete, and no avoiding a flood.



This political structure was exemplified by former Harris County Flood Control District Executive Director Mike Talbott, who refused to study global warming and its impact on our region, who dismissed warnings about runoff from a developed Katy Prairie, and denigrated concerns from scientists and conservationists as "anti-development."

Talbott may have left office, but that philosophy of development at any cost remains the status quo around Commissioners Court, City Hall and the state Legislature.

Hydrologists, environmentalists, scientists and activists offered a prescient vision of destruction that went ignored. If Houston wants to rebuild a resilient city, then we must lift those with true foresight out of the political wilderness and put them in proximity to the levers of power.

What lessons will Houston-area officials learn from Harvey? History gives us a clue

> As Houston begins to recover from Harvey, a growing chorus of voices is calling for big policy changes to reduce flood damage from future disasters. Local officials haven't said much about what they might pursue, but history offers some clues.

BY **NEENA SATIJA** SEPT. 8, 2017 8 HOURS AGO

Aerial view of flooding from Tropical Storm Allison in Houston on June 9, 2001.
NOAA

A growing chorus of voices — from scientists to some government officials to members of

the public — say big policy changes need to be made in the Houston region after Hurricane Harvey dumped a record amount of rain there and swamped thousands of homes.

With the recovery process just getting started, local officials haven't said much about what those policy changes might be. And in a statement to The Texas Tribune, Houston Mayor Sylvester Turner's spokesman said Harvey would have flooded the "relatively flat city that is crisscrossed by waterways … regardless of what planning and land usage regulations were in place."

But the Bayou City has been here before. The worst rainstorm to befall an American city in modern history before Harvey was Tropical Storm Allison, which dumped more than 40 inches of rain on Houston in five days, flooding 73,000 residences and 95,000 vehicles. Allison caused $5 billion in damage to Harris County alone — and Harvey's cost is expected to soar well past that level.

Houston and Harris County officials pursued a number of major policy changes after Allison. Some of them had modest success; some were abject failures. Many are likely to come up again after Harvey, on an even bigger scale than before. Here are the big ones:

Buying out homes most likely to flood again

Just months after Allison, Harris County began to pay people to leave their homes — ultimately spending hundreds of millions of dollars of mostly federal money. The county targeted thousands of families who suffered flood damage and lived in 100-year floodplains — areas with at least a 1 percent chance of flooding in a given year. The idea was that it would be cheaper to pay residents to live elsewhere than constantly paying out flood insurance claims.

Experts say the program was a good one, but didn't go far enough. Since Allison, the county's flood control district has purchased about 2,400 homes, but a recent study said that at least 3,300 more should be targeted for immediate buyouts. Even if those homes were bought out, that still leaves tens of thousands in the 100-year floodplain.

Local officials will surely ask for more money to buy out homes after Harvey. But they'll have to depend largely on the generosity of Congress — and if they get more

money, they'll have to convince many Houstonians who haven't been willing take the money and move after previous floods.

The Harris County Flood Control District has already started asking homeowners whether they're interested in buyouts post-Harvey, though no money is available yet.

"Buyouts are on the table … voluntary and involuntary," said Harris County Judge Ed Emmett. "That's got to be an option."

Re-mapping the floodplain

Harris County devoted tens of millions of federal dollars after Tropical Storm Allison to re-map its floodplains. The process took a lot longer than expected, and resulted in numerous lawsuits. But experts say the redrawn maps still don't reflect the true floodplains.

That's partly because the flood maps don't account for what climate scientists say is an increase in the number and frequency of massive rainfall events (Harris County is in the middle of a large study that could result in updating some of those rainfall expectations).

There may be calls to re-map floodplains again after Harvey. But if Texas officials secure the money to do it, it would take years. Meanwhile, experts also say the whole concept of the 100-year floodplain is becoming less and less useful. During Tropical Storm Allison, more than half the homes that flooded were outside the 100-year floodplain; that didn't change during subsequent floods even after the maps were updated.

Restricting building in flood-prone areas

As part of a broad effort to revisit development policies after the devastation of Tropical Storm Allison, in 2006 the city of Houston tried to restrict building in the "floodway" — an area within the floodplain that is at particular risk of being damaged by flooding because it's directly in the central current of floodwaters.

It seemed like a no-brainer to many at the time. Since the mid-1960s — well before people fully understood what floodplains were — a Houston ordinance had technically forbidden building in a floodway. But the policy was riddled with exceptions that led

to thousands of dwellings being built in floodways. So five years after Allison, the city decided to get rid of those exceptions.

The result was a political catastrophe. As the floodplain maps were redrawn after Allison, hundreds of new properties were suddenly in the floodway. That meant their owners could no longer renovate them or build anything new. Property values dropped instantly. A series of lawsuits and a political firestorm pressured the Houston City Council into severely weakening the restrictions two years later.

Today, some members of the public and scientists are mystified that it is still possible to build in the floodway in the city of Houston. But many people who strongly opposed the floodway ordinance are still influential in Houston.

For instance, Paul Bettencourt — now a Republican state senator — was tax assessor for Harris County when the floodway ordinance was adopted, and at the time bitterly complained that the policy would cost the area millions in tax revenue. And Adrian Garcia, then a city councilman who would later become Harris County sheriff, represented many residents who lived in floodways.

Garcia, now a private consultant, said he doesn't regret weakening the restrictions. "The floodway ordinance was just a fraction of the solution," he said. "If we were to take a truly comprehensive, multi-dimensional approach to our flooding and drainage issues, then it could be brought to the table as part of a total package."

Updating old infrastructure

After Allison, federal disaster relief money helped accelerate projects the county was already working on — such as upgrading the infrastructure around the bayous that carry floodwater through and away from Houston. Hundreds of millions of federal and local dollars have already been spent, and Harvey may help secure more money needed to finish these projects.

But many of the bayou upgrades have taken years longer than anticipated, and the damage from Harvey might set them even farther back. Meanwhile, none of this work would prevent flooding from a massive event like Harvey. Flood control officials say it wouldn't even protect homes from events of a much smaller scale than Harvey, like the 2016 Tax Day floods.

Harvey has widely been referred to as at least a 500-year flood — a disaster with just a .2 percent chance of occurring in any given year. Flood control officials say protecting neighborhoods surrounding all of Harris County's bayous from just a 100-year flood would cost $25 billion.

Currently, the county has been spending about $80 million a year on these upgrades. At that rate it would take 400 years to get the job done. Harvey relief dollars may increase that level of spending, but it's still an daunting task.

On top of public works projects around bayous, the region has also tried to improve its dismal drainage system. Former Mayor Annise Parker's "Rebuild Houston" initiative, an $8 billion program approved by Houston voters in 2010, called for a dedicated drainage fee to address the problem. But the fee and the program have been beset with controversy and lawsuits.

Bettencourt, the Republican state senator, said he led opposition to Rebuild Houston because many of its initial promises were abandoned. He added that much of the money being collected in drainage fees is not actually being used for drainage.

"There's clearly a need to take what happened with Harvey and figure out really how to prevent any mistakes that were made … [and] more importantly, find the lessons learned that people knew in the past," Bettencourt said. "It's just time that we collect everything we've learned, everything that we saw and do the best to implement fixes for future generations of Texans."

Kiah Collier contributed reporting.

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- Hurricane Harvey ravaged the Texas Coast and left Houston — the nation's fourth-largest city — grappling with unprecedented flooding. Do you need help? Or do you want to help those in need? Check out these resources. [Full story]
- Since Hurricane Harvey first hit the Texas coast on Aug. 25, Texans have had to come to terms with widespread damage caused by the storm. Take a look at just some of what Texans are dealing with. [Full story]

HURRICANE NEWS AND STORM TRACKING

Hurricane Irma downgraded to Category 4 storm, still 'extremely dangerous'

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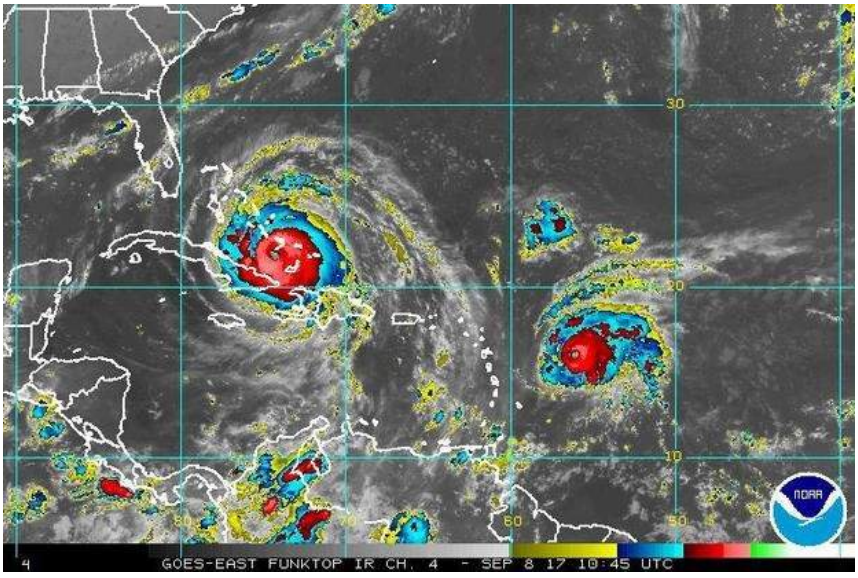
Updated on September 8, 2017 at 6:54 AM
Posted on September 8, 2017 at 6:28 AM



Hurricane Irma was downgraded to a Category 4 storm early Friday morning (Sept. 8), according to the National Hurricane Center. However, forecasters said the storm remains "dangerous" and "extremely powerful." (Image via NOAA)

By Carlie Kollath Wells, cwells@nola.com,
NOLA.com | The Times-Picayune

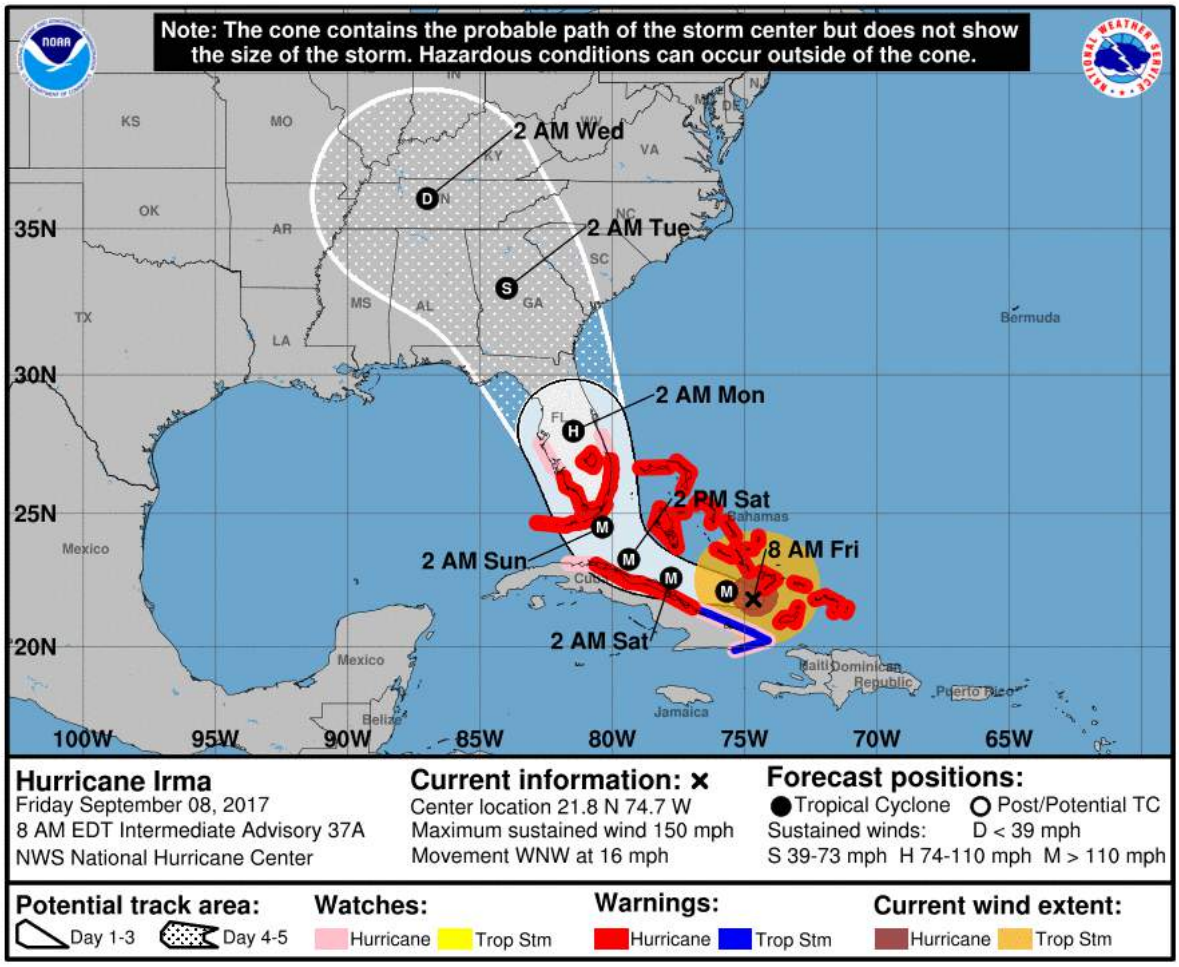
Hurricane Irma was downgraded to a Category 4 storm early Friday morning (Sept. 8), according to the National Hurricane Center. However, forecasters said the storm remains "dangerous" and "extremely powerful."

Hurricane Irma is expected to hit Florida this weekend. (latest track)

As of 7 a.m., Hurricane Irma was 80 miles northeast of Cabo Lucrecia, Cuba, and about 450 miles southeast of Miami. It was moving northwest at 16 mph.

It had maximum sustained winds of 150 mph. Category 5 storms have winds of 157 mph or greater on the Saffir-Simpson Hurricane Wind Scale (read more). Forecasters said some fluctuations in intensity are likely during the next day or two, but Irma is forecast to remain a "powerful" category 4 hurricane during the next couple of days.

The National Hurricane Center expects the storm to turn toward northwest by late Saturday. On the forecast track, the eye of Irma should move near the north coast of Cuba and the central Bahamas on Friday and Saturday. It is expected to be near the Florida Keys and the southern Florida peninsula on Sunday morning.



Hurricane Irma continues to head to Florida. Here's the storm's five-day track, as of 7 a.m. Friday. (Image via National Hurricane Center) (Carlie Kollath Wells)

Hurricane-force winds extend up to 70 miles from the center and tropical-storm-force winds extend up to 185 miles.

The National Hurricane Center is warning of a "life-threatening storm surge," in addition to "large and destructive waves." In the Florida Keys, a storm surge of 5 to 10 feet is possible. In the Turks and Caicos Islands and southeastern and central Bahamas, a storm surge of 15 to 20 feet is possible.

Hurricanes Are Sweeping The Atlantic. What's The Role Of Climate Change?

September 8, 20177:19 AM ET

CHRISTOPHER JOYCE

In this GOES-16 geocolor satellite image taken Thursday, the eye of Hurricane Irma (left) is just north of the island of Hispaniola, with Hurricane Jose (right) in the Atlantic Ocean.

NOAA/AP

Hurricane Irma is hovering somewhere between being the most- and second-most powerful hurricane recorded in the Atlantic. It follows Harvey, which dumped trillions of gallons of water on South Texas. And now, Hurricane Jose is falling into step behind Irma, and gathering strength.

Is this what climate change scientists predicted?

In a word, yes. Climate scientists such as Michael Mann at Penn State says, "The science is now fairly clear that climate change will make stronger storms stronger." Or wetter.

Scientists are quick to point out that Harvey and Irma would have been big storms before the atmosphere and oceans started warming dramatically about 75 years ago. But now storms are apt to grow bigger. That's because the oceans and atmosphere are, on average, warmer now than they used to be. And heat is the fuel that takes garden-variety storms and supercharges them.

THE TWO-WAY

Gas In The Tank, Cafecito In Hand: Floridians Prepare For Irma

The National Oceanic and Atmospheric Administration predicted that the Atlantic hurricane season this year would be big. They said the most

likely scenario would be five to nine hurricanes and three to five major hurricanes, which is above the long-term average.

Some of their reasoning is based on climate change. The eastern tropical Atlantic ocean is the fuel tank of hurricanes, if you will, and big parts of the sea surface have been between .5 and 1 degree Celsius warmer than average this summer. Now, the Atlantic goes through normal cycles of warming and cooling that have nothing to do with climate change, such as in response the El Nino and La Nina weather cycles. But this year neither cycle is active.

THE TWO-WAY

Hurricane Irma Leaves Devastation Of 'Epic Proportions' In Caribbean

And whether or not Irma was emboldened by climate change, what's more telling are hurricane trends. Big hurricanes in the Pacific as well as the Atlantic appear to be happening more often and are packing more punch than normal.

This composite image shows Hurricane Irma's path as it moved into the warm waters of the western Atlantic. Sea surface temperatures are high this year.

NASA/NOAA

Climate scientist Kevin Trenberth from the National Center for Atmospheric Research explains: "Previous very active (hurricane) years were 2005 and 2010," he says, and along with 2017, they experienced warm Atlantic ocean temperatures. "So this sets the stage. So the overall trend is global warming from human activities."

It's worth noting that there are other things that made Irma big that have no clear association with climate change. Vertical wind shear in the hurricane "nursery" region of the Atlantic are weak this year. Strong wind shear at the right altitude can in essense

"behead" a hurricane as it forms, so Irma has free rein to build. There's also a long-term cycle in Atlantic — the Atlantic Multi-Decadel Oscillation — that affects hurricane-forming conditions. Since 1995, the AMO is in the "on" position for good hurricane conditions, and in fact the period since then has been quite active for storms and hurricanes.

So, as with Harvey, these superstorms have always happened due to natural causes, but the underlying conditions in the oceans and atmosphere have primed the pump. You don't need much effort now to turn a trickle into a gusher.

Researchers warn of high bacteria levels in Clear Lake floodwaters

By Mihir Zaveri Published 6:43 pm, Thursday, September 7, 2017

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University of Houston-Clear Lake researchers have found staggering levels of dangerous E. coli and other fecal bacteria in Hurricane Harvey floodwaters in the Clear Lake watershed.

The amount of bacteria found by researchers in some cases was 100 times those set by the U.S. Environmental Protection Agency for recreational water use.

How sick and what sicknesses people could face by coming into contact with the contaminated floodwaters depends on a number of factors, including how long one was exposed to the water, the presence of open wounds, and the source of the contamination.

It is unclear where this bacteria came from, said Michael LaMontagne, a microbiology professor at the university.

"Identifying the source of the contamination matters greatly in terms of the health risk, knowing whether the source of the indicated bacteria is human feces or sewage rather than from pets, livestock or wildlife," LaMontagne said.

Severe storms and floods pose widespread public health threats. Area hospitals already have reported an uptick in patients with skin infections from coming into contact with contaminated floodwaters.

Texas A&M researchers found similar contamination levels last week. Floodwater samples from the Cypress area were found to contain 125 times the E. coli level considered safe for swimming, and 15 times higher than acceptable levels for wading.

As of Thursday afternoon, more than 20 communities across Harris County still faced warnings to boil their water before consumption or other use. The entire city of Beaumont has been without water for days; city officials there said Thursday they would lift a boil-water notice after flushing water lines.

In Clear Lake, the findings by LaMontagne and other researchers were part of a long-standing monitoring project of the water quality there.

LaMontagne said, generally, water in the area does have high levels of contaminants, but he had not analyzed the data further.

He said that the researchers had submitted a $30,000 proposal to the National Science Foundation to further analyze the samples collected in the aftermath of Harvey to determine their source.

That proposal is pending.

"We plan to complete that analysis if we receive funding, within about a month," LaMontagne said.

LaMontagne said collected samples along the banks of Clear Creek on Aug. 30 as floodwaters from Harvey drained into the waterway.